

WHAT IS CLAIMED IS:

1. A detector for detecting and simultaneously diagnosing at least one subtype of human papilloma viruses (HPV) contained in a biological sample, comprising:

a carrier;

a plurality of micro-dots immobilized on said carrier, wherein each micro-dot is for identifying one particular HPV subtype, and said HPV subtype is one selected from a group consisting of (HPV 6, HPV 11, HPV 16, HPV 18, HPV 26, HPV 31, HPV 32, HPV 33, HPV 35, HPV 37, HPV 39, HPV 42, HPV 43, HPV 44, HPV 45, HPV 51, HPV 52, HPV 53, HPV 54, HPV 55, HPV 56, HPV 58, HPV 59, HPV 61, HPV 62, HPV 66, HPV 67, HPV 68, HPV 69, HPV 70, HPV 72, HPV 74, HPV 82, HPV CP8061, HPV CP8034, HPV L1AE5, HPV MM4, HPV MM7 and HPV MM8); and

at least one oligonucleotide sequence contained in each said micro-dot that is specific to said one particular HPV subtype;

wherein said at least one oligonucleotide sequence serves as a detection probe that hybridizes specifically with an L1 gene sequence of said one particular HPV subtype to form a hybridization complex as a detection indicator, so that each micro-dot identifies one particular HPV subtype via a corresponding oligonucleotide of said one particular HPV subtype, and thereby detecting and simultaneously identifying subtypes of human papilloma viruses.

2. The detector according to claim 1, wherein said at least one oligonucleotide that hybridizes specifically with an L1 gene sequence of said one particular HPV subtype is respectively chosen from the following list for each HPV subtype: (SEQ ID NO:1-SEQ ID NO:12) for HPV 6, (SEQ ID NO:13-SEQ

ID NO:24) for HPV 11, (SEQ ID NO:25-SEQ ID NO:36) for HPV 16, (SEQ ID NO:37-SEQ ID NO:48) for HPV 18, (SEQ ID NO:49-SEQ ID NO:58) for HPV 26, (SEQ ID NO:59-SEQ ID NO:68) for HPV 31, (SEQ ID NO:69-SEQ ID NO:79) for HPV 32, (SEQ ID NO:80-SEQ ID NO:90) for HPV 33, (SEQ ID NO:91-SEQ ID NO:100) for HPV 35, (SEQ ID NO:101-SEQ ID NO:112) for HPV 37, (SEQ ID NO:113-SEQ ID NO:123) for HPV 39, (SEQ ID NO:124-SEQ ID NO:133) for HPV 42, (SEQ ID NO:134-SEQ ID NO:143) for HPV 43, (SEQ ID NO:144-SEQ ID NO:154) for HPV 44, (SEQ ID NO:155-SEQ ID NO:165) for HPV 45, (SEQ ID NO:166-SEQ ID NO:177) for HPV 51, (SEQ ID NO:178-SEQ ID NO:189) for HPV 52, (SEQ ID NO:190-SEQ ID NO:199) for HPV 53, (SEQ ID NO:200-SEQ ID NO:209) for HPV 54, (SEQ ID NO:210-SEQ ID NO:218) for HPV 55, (SEQ ID NO:219-SEQ ID NO:228) for HPV 56, (SEQ ID NO:229-SEQ ID NO:239) for HPV 58, (SEQ ID NO:240-SEQ ID NO:250) for HPV 59, (SEQ ID NO:251-SEQ ID NO:261) for HPV 61, (SEQ ID NO:262-SEQ ID NO:272) for HPV 62, (SEQ ID NO:273-SEQ ID NO:283) for HPV 66, (SEQ ID NO:284-SEQ ID NO:294) for HPV 67, (SEQ ID NO:295-SEQ ID NO:305) for HPV 68, (SEQ ID NO:306-SEQ ID NO:316) for HPV 69, (SEQ ID NO:317-SEQ ID NO:328) for HPV 70, (SEQ ID NO:329-SEQ ID NO:341) for HPV 72, (SEQ ID NO:342-SEQ ID NO:353) for HPV 74, (SEQ ID NO:354-SEQ ID NO:362) for HPV 82, (SEQ ID NO:363-SEQ ID NO:374) for HPV CP8061, (SEQ ID NO:375-SEQ ID NO:386) for HPV CP8034, (SEQ ID NO:387-SEQ ID NO:397) for HPV L1AE5, (SEQ ID NO:398-SEQ ID NO:408) for HPV MM4, (SEQ ID NO:409-SEQ ID NO:419) for HPV MM7, and (SEQ ID NO:420-SEQ ID NO:429) for HPV MM8.

3. The detector according to claim 1, wherein said carrier is a nylon membrane.
4. The detector according to claim 1, wherein said carrier is a glass plate.
5. The detector according to claim 1, wherein said detector is an oligonucleotide biochip.
6. The detector according to claim 1, wherein said at least one oligonucleotide has a length between 15-30 bases.
7. The detector according to claim 1 further comprising a micro-dot containing a Glutaldehyde-3-phosphodehydrogenase (GAPDH) gene, which is used as an internal control.
8. A method for detecting and simultaneously diagnosing at least one subtype of human papilloma viruses (HPV) contained in a biological sample, comprising steps of:
  - amplifying an L1 gene fragment of human papilloma viruses (HPV) contained in said biological sample and obtaining an amplification product by polymerase chain reaction (PCR) using primers labeled with signaling substance;
  - hybridizing said amplification product with a detector according to Claim 1 to form a hybridization complex;
  - removing nonhybridized said amplification product; and
  - detecting said hybridization complex through detecting said signaling substance, thereby detecting and simultaneously identifying HPV subtypes contained in said biological sample.
9. The method according to claim 8, wherein said amplification product has a length of 450 base pairs by using MY09 as sense primer and MY11 as anti-sense primer in polymerase chain reaction (PCR).

10. The method according to claim 8, wherein said amplification product has a length of 190 base pairs by using MY11 as sense primer and GP6+ as anti-sense primer in polymerase chain reaction (PCR).
11. The method according to claim 8, wherein said signaling substance is biotin.
12. The method according to claim 11, wherein said biotin reacts with avidin-alkalinephosphatase to show said hybridization result by presenting a particular color.
13. The method according to claim 8, wherein said signaling substance is a fluorescent substance.
14. The method according to claim 13, wherein said fluorescent substance is Cyanine 5.
15. A probe which hybridizes to nucleic acid from an HPV subtype, said probe being selected from the group consisting of:
  - SEQ ID NO:1-SEQ ID NO:12 and sequences fully complementary thereto, which hybridize with HPV 6;
  - SEQ ID NO:13-SEQ ID NO:24 and sequences fully complementary thereto, which hybridize with HPV 11;
  - SEQ ID NO:25-SEQ ID NO:36 and sequences fully complementary thereto, which hybridize with HPV 16;
  - SEQ ID NO:37-SEQ ID NO:48 and sequences fully complementary thereto, which hybridize with HPV 18;
  - SEQ ID NO:49-SEQ ID NO:58 and sequences fully complementary thereto, which hybridize with HPV 26;
  - SEQ ID NO:59-SEQ ID NO:68 and sequences fully complementary thereto, which hybridize with HPV 31;

SEQ ID NO:69-SEQ ID NO:79 and sequences fully complementary thereto, which hybridize with HPV 32;

SEQ ID NO:80-SEQ ID NO:90 and sequences fully complementary thereto, which hybridize with HPV 33;

SEQ ID NO:91-SEQ ID NO:100 and sequences fully complementary thereto, which hybridize with HPV 35;

SEQ ID NO:101-SEQ ID NO:112 and sequences fully complementary thereto, which hybridize with HPV 37;

SEQ ID NO:113-SEQ ID NO:123 and sequences fully complementary thereto, which hybridize with HPV 39;

SEQ ID NO:124-SEQ ID NO:133 and sequences fully complementary thereto, which hybridize with HPV 42;

SEQ ID NO:134-SEQ ID NO:143 and sequences fully complementary thereto, which hybridize with HPV 43;

SEQ ID NO:144-SEQ ID NO:154 and sequences fully complementary thereto, which hybridize with HPV 44;

SEQ ID NO:155-SEQ ID NO:165 and sequences fully complementary thereto, which hybridize with HPV 45;

SEQ ID NO:166-SEQ ID NO:177 and sequences fully complementary thereto, which hybridize with HPV 51;

SEQ ID NO:178-SEQ ID NO:189 and sequences fully complementary thereto, which hybridize with HPV 52;

SEQ ID NO:190-SEQ ID NO:199 and sequences fully complementary thereto, which hybridize with HPV 53;

SEQ ID NO:200-SEQ ID NO:209 and sequences fully complementary thereto, which hybridize with HPV 54;

SEQ ID NO:210-SEQ ID NO:218 and sequences fully complementary thereto, which hybridize with HPV 55;

SEQ ID NO:219-SEQ ID NO:228 and sequences fully complementary thereto, which hybridize with HPV 56;

SEQ ID NO:229-SEQ ID NO:239 and sequences fully complementary thereto, which hybridize with HPV 58;

SEQ ID NO:240-SEQ ID NO:250 and sequences fully complementary thereto, which hybridize with HPV 59;

SEQ ID NO:251-SEQ ID NO:261 and sequences fully complementary thereto, which hybridize with HPV 61;

SEQ ID NO:262-SEQ ID NO:272 and sequences fully complementary thereto, which hybridize with HPV 62;

SEQ ID NO:273-SEQ ID NO:283 and sequences fully complementary thereto, which hybridize with HPV 66;

SEQ ID NO:284-SEQ ID NO:294 and sequences fully complementary thereto, which hybridize with HPV 67;

SEQ ID NO:295-SEQ ID NO:305 and sequences fully complementary thereto, which hybridize with HPV 68;

SEQ ID NO:306-SEQ ID NO:316 and sequences fully complementary thereto, which hybridize with HPV 69;

SEQ ID NO:317-SEQ ID NO:328 and sequences fully complementary thereto, which hybridize with HPV 70;

SEQ ID NO:329-SEQ ID NO:341 and sequences fully complementary thereto, which hybridize with HPV 72;

SEQ ID NO:342-SEQ ID NO:353 and sequences fully complementary thereto, which hybridize with HPV 74;

SEQ ID NO:354-SEQ ID NO:362 and sequences fully complementary thereto, which hybridize with HPV 82;

SEQ ID NO:363-SEQ ID NO:374 and sequences fully complementary thereto, which hybridize with HPV CP8061;

SEQ ID NO:375-SEQ ID NO:386 and sequences fully complementary thereto, which hybridize with HPV CP8034;

SEQ ID NO:387-SEQ ID NO:397 and sequences fully complementary thereto, which hybridize with HPV L1AE5;

SEQ ID NO:398-SEQ ID NO:408 and sequences fully complementary thereto, which hybridize with HPV MM4;

SEQ ID NO:409-SEQ ID NO:419 and sequences fully complementary thereto, which hybridize with HPV MM7; and

SEQ ID NO:420-SEQ ID NO:429 and sequences fully complementary thereto, which hybridize with HPV MM8.